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(54) Image forming apparatus having remote maintenance function and method of remote maintenance

(57) An image forming apparatus is disclosed, in which the operating program can be changed even after the apparatus is delivered to the customer to perform the control meeting the prevailing status of the apparatus. An image of an original is read and formed by a mechanism (12 to 15), the status of the image forming apparatus is detected by a sensor (22, 41), a first program for controlling the image forming mechanism is stored in a memory (64), a second program for controlling the apparatus according to the detected status is requested by a mechanism (3, 67, S67), the second program is received by and stored in a memory (64, S67) according to the request, and the image forming apparatus is controlled by a mechanism (5, S69)in accordance with the first and second programs.

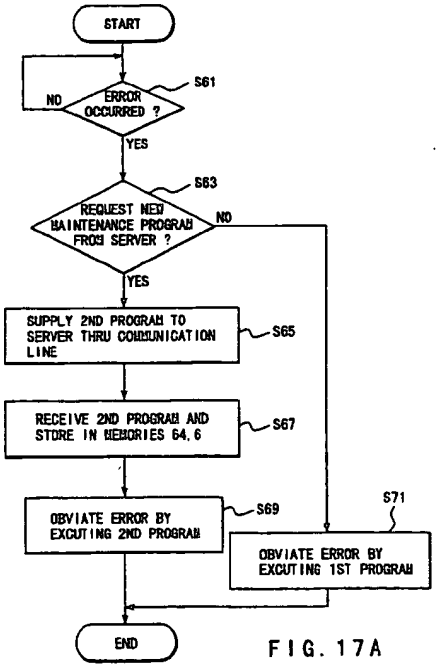

FIG. 17A

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A specific machine allowed to stand for an hour has been found to vaporize as much oil as would be consumed for producing about five copies on the average.

Secondly, the surface of the conventional fixing rollers is known to wear as it is rubbed by a pawl or the like while in rotation. It has so far been considered that this phenomenon is the primary cause of the deterioration of the fixing roller and the other factors can be virtually ignored.

A fact-finding survey of the market, however, has revealed that the fixing roller of the image forming apparatus installed in the premises of infrequent users is deteriorated in proportion to the length of time the fixing roller is allowed to stand in wait mode rather than by reason of the surface wear caused by the friction described above. This is due to the fact that since the fixing roller is left to stand for a long time in high-temperature wait mode, the adhesive used for joining the aluminum stock tube of the fixing roller with the teflon material coating the fixing roller surface comes off as the properties thereof are deteriorated by thermal stress. As a result, the surface coated material peels off before the lapse of a predetermined length of time (before the surface coated material is worn) having nothing to do with the number of actual copying operations. The fixing roller thus is considered to face the end of the service life thereof due to an adverse phenomenon which has hitherto been inconceivable.

The foregoing is a prediction of the deterioration of a fixing roller and a fixing silicon roller which is effective only to the extent of the currently-available knowledge. The knowledge presented above regarding the service life of the consumable parts is nothing but the technical one relating to the parts, and it is difficult to specify parameters having a deterministic effect on the service life. In order to find the real factors affecting the service life of the parts, therefore, it has been necessary for us to repeatedly compare the actual manner in which the fixing roller is operated with the actual length of time it is used.

This task has required the collection and analysis of lots of data over a long period of time, followed by repeated collection and analysis under the data measuring conditions corrected based on the result of previous analysis. Even the above-mentioned technique for monitoring the consumption of the fixing roller and the fixing silicon roller may become obsolescent any time in the future when a new, superior technique may be found.

Certainly, a superior method will be revealed in the future. At this time point, it is difficult to specify what is the future technique. It may become clear, for example, that the service life of the fixing unit is affected considerably by the accumulated time of temporary overshoots of the control temperature or the low- and high-temperature heat cycles. Such a problem could be readily obviated by a small correction of the technical specifications slightly. Actual execution of the small correction, however, makes it necessary to incorporate a corresponding program in an image forming apparatus.

An attempt to collect various parameters and confirm a correlation, at least as a test case, between an estimated service life and the actual service life of a given part under various conditions of machine operation will fail unless a required control procedure is incorporated in the image forming apparatus in advance. An actual product, however, has only a limited program memory. Even though it is desirable to incorporate a parameter collection program in advance, a control procedure for effective data collection is virtually impossible to specify before shipping the product from the factory.

As described above, the problem of the conventional image forming apparatus is that the service life of the parts such as the fixing roller and the fixing silicon roller, the properties of which are deteriorated with the length of waiting time, cannot be accurately grasped. Therefore, successful preventive maintenance is impossible.

Also, once a product is delivered to the user, adding a program of a new specification (a program intended to estimate the time before a specified part is consumed by changing the data collection parameters from time to time in accordance with the prevailing conditions) to the apparatus requires a change in the control program and hardware and thus involves a program installation work on a very large scale.

The object of the present invention is to provide an image forming apparatus in which preventive maintenance is possible by accurately grasping the service life of a given part deteriorated in characteristics with the length of waiting time and in which even after product shipment, a maintenance program of a new specification can be added or the existing maintenance program can be modified without changing the hardware or the machine control program. And this invention provides a method of above remote maintenance using a new specification program.

According to the present invention, there is provided an image forming apparatus comprising means for reading an image of an original and forming the image on an image-forming medium, means for detecting the status of the image forming apparatus, means for storing a first program for controlling the image forming means, means for requesting a second program for controlling the image forming apparatus according to the status of the image forming apparatus detected by the detection means, means for receiving the second program from an external device in accordance with the request of the requesting means, means for storing the second program received by the receiving means, and first control means for controlling the image forming means on the basis of the first program and the second program.

The present invention with the above-mentioned configuration has the following advantages.

Specifically, unlike in the prior art, the program for providing maintenance each time an error occurs in an image forming apparatus according to the invention is

Further, an original rest 38 is located on the upper surface of the body 11.

In normal copy mode, light is scanned on the original 0 placed on the original rest 38, and the light reflected is focused on the photosensitive drum 12 with the surface thereof charged by the electrostatic charger 13 thereby to form an electrostatic latent image. This electrostatic latent image is developed by the developer supplied thereto. At the same time, the paper P is supplied from the paper feed cassettes 30a, 30b, 30c or the large-capacity cassette 30d, so that the paper P is fed to an image transfer unit 12a between the photosensitive drum 12 and the transfer charger 17 thereby to transfer a developed image from the photosensitive drum 12 onto the paper P. The paper to which the image is transferred is separated from the photosensitive drum 12 by means of the separation charger 18, and sent to by the transport belt 34 and fixed in the fixing unit 35 constituting fixing means. The paper P on which the image is fixed is discharged through the discharge roller pair 36.

In the case where images are copied on the two sides of the paper, a gate means 37 is switched to an inverted paper feeder 39. Thus the paper P is led to the inverted paper feeder 39, where the paper is reversed and transported along the paper transport path 32 again. An image is transferred on the reverse side, and then the paper is fixed and discharged.

FIG. 3 shows a configuration of the fixing unit 35. The fixing unit 35 includes a fixing roller 40 with an aluminum core metal and a teflon-coated surface, a heater lamp 41 for heating the fixing roller 40 from within, a temperature sensor 43 constituting detection means for detecting the surface temperature of the fixing roller 40, a fixing silicon roller 44 for applying silicon oil on the surface of the fixing roller 40, a silicon rubber roller 45 for applying heat to the paper pressed against the surface of the fixing roller 40, and a stainless steel pawl 46 for separating the paper P from the fixing roller 40 after being passed between the fixing roller 40 and the silicon rubber roller 45.

Upon complete copying operation, the paper P to which the image has been transferred on the photosensitive drum 12 is led by the fixing roller 40 and the silicon rubber roller 45 of the fixing unit 35. In the process, the paper P is heated by the fixing roller 40 and the silicon rubber roller 45 in rotation, with the result that a toner is melted and fixed. The paper P that has passed through the fixing roller 40 and the silicon rubber roller 45 is separated from the fixing roller 40 and discharged into a discharge tray 4 by means of the silicon oil supplied from the fixing silicon roller 4 rotating like the fixing roller 40 on the one hand and the stainless steel pawl 46 on the other hand.

In the above-mentioned process, when the two rollers including the fixing roller 40 and the silicon rubber roller 45 rotate, the surface of the fixing roller 40 is worn by being rubbed by the stainless steel pawl 46. The result is the wear of the fixing roller 40 described above with reference to the second aspect of the prior art. In similar fashion, as a result of the silicon oil being supplied to the fixing roller 40 with the rotation of the fixing silicon roller 44, the silicon oil stored in the fixing silicon roller 44 is consumed as described with reference to the first aspect of the prior art.

FIG. 1 shows an external configuration of the copier 1 constituting an image forming apparatus according to the present invention. The copier 1 comprises an automatic original feeder (ADF) 7 on the upper part of the body 11 and an operating panel 50 on the upper front part of the body 11 for inputting various copying conditions and a copy start signal for starting the copying operation. Also, the paper feed cassettes 30a, 30b, 30c, 30d are arranged in the lower part of the body 11. Further, an IC card insertion hole 2 and a remote monitor connector 3 are arranged on the upper front side of the body 11. A discharge tray 4 into which the copied paper P is discharged is arranged at the left end of the body 11.

FIG. 4 shows a configuration of the operating panel 50 including a ten-key board 51, a copying key 52, a display section 53, a cassette key 54, zoom up/down keys 55, a size selecting section 56, a status indicator 57, density setting keys 58 and a mode setting section 59.

The ten-key board 51 includes keys 0 to 9 for setting the number of originals loaded and the number of copies desired.

The copying key 52 is for instructing the copy operation to be started.

The display section 53 is a reporting means for displaying the number of originals, the number of copies and various other information such as the count value and the copying magnification as an operation guide.

The cassette key 54 is depressed to switch to another size of cassette when the cassette selected is not of the desired size.

The zoom up/down keys 55 are for setting the magnification for enlarging or compressing the original.

The status indicator 57 indicates a jam condition, etc. by turning on a light-emitting diode.

The density setting keys 58 are for setting the image density at "thin" or "dense".

The mode setting section 59 is for setting various modes including the service mode SW10, the two-side mode, the binding margin, the edition, the frame removal and the page connection.

FIGS. 5A and 5B illustrate an example display on the display section 53 of the operating panel 50. FIG. 5A shows the case in which the operating panel 50 is manipulated to set the apparatus to service mode SW10 indicating the magnification of 100%, the upper stage cassette, i.e., the paper feed cassette 30a, the paper size of A3, one as the number of copies, and the count value of 000253.

Instead of setting to service mode SW10 through the operating panel 50, a center computer described later connected through a connector 3 may send a command requesting the transmission of the count value of each paper feed stage, so that the count value of each

changed remotely as described with reference to FIG. 5. Upon complete data receipt, the communication task is terminated, and the control unit 5 performs other tasks for the copier 1 and, after a predetermined length of time, repeats the execution of the communication process.

FIG. 11 is a map of the NVRAM 64 according to this embodiment. When the NVRAM (IC) card 6 is inserted into the IC card insertion hole 2, the NVRAM area is enlarged.

FIGS. 12A and 12B show formats of the transmit and receive commands according to the present embodiment. As shown in FIG. 12A, the transmit command is configured of a transmit request command, a start address, a transmission size and an end code. On the other hand, as shown in FIG. 12B, the receive command is constructed of a receive request command, a start address, a size n, a gap code, a data n and an end code.

The center computer 70 designates the head address of the area written with the "waiting time count subroutine" program of the NVRAM 64 as a write start address of the receive request command. When the center computer attaches a new "waiting time count subroutine program code" as the designated data, then the "waiting time count subroutine" of the copier 1 can be changed.

In the prior art, a program is so configured that the waiting time begins to be accumulated when the fixing unit 35 reaches a copying temperature (180°C). Such a program can be modified by a transmit command to start the counting when the temperature of the fixing unit 35 exceeds 150°C, for example. The feature of the present invention is that the program can be changed easily even after shipment by configuring a monitor program in the NVRAM 64 and making it possible to change the related data as described above. Especially, when the NVRAM (IC) card 6 is inserted in the IC card insertion hole 2, the NVRAM area is enlarged as shown in FIG. 11. It is therefore possible to incorporate a larger program.

The availability of a program from an external device (server, etc.) constituting the feature of the invention will be described in detail later with reference to a flowchart.

Now, the operation of starting to accumulate the waiting time according to various programs transmitted will be explained with reference to FIGS. 13A, 13B and 14.

Reference is made to FIG. 13A for explaining the case in which the program shown in routine A is transmitted. First, the fixing unit 35 is checked to make sure whether the temperature thereof is a fixable one or not (S11). If the temperature has not reached a fixable level, the process ends, while if the fixable temperature is reached, the time is checked to see whether one second has elapsed from the previous update (S12). Unless one second has elapsed, the process ends, while if one second has passed, the accumulation timer is updated (S13).

With reference to FIG. 13B, explanation will be made about the case in which the program shown in routine B is transmitted. First, the fixing unit 35 is checked to see whether its temperature is 150°C or not (S21). If the temperature of the fixing unit 35 is less than 150°C, the process ends, while if the temperature is 150°C or higher, the time is checked to see whether one second has passed from the previous update (S22). If one second has not passed, the process ends, while if one second has passed, the accumulation timer is updated (S23).

The operation for the case in which the program shown in routine C is transmitted will be explained with reference to FIG. 14. First, the temperature of the fixing unit 35 is checked to see whether it is higher than a fixable temperature plus ten degrees (S31). In the case where the temperature of the fixing unit 35 is not higher than the fixable temperature plus ten degrees, the process ends. If the temperature of the fixing unit 35 is higher than the fixable temperature plus ten degrees, on the other hand, the time is checked to see whether one second has passed from the previous update (S32). Unless one second has passed, the process ends, while if one second has passed, the accumulation timer is updated (S33).

Now, the operation corresponding to the accumulation time indicated by the accumulation timer will be explained with reference to the flowchart of FIG. 15. Specifically, the accumulation timer is checked as to whether the time of level 1 has been exceeded or not as routine D (S41). If the time of level 1 is not exceeded, the process ends. In the case where the accumulation timer has exceeded the time of level 1, on the other hand, "CALL THE SERVICE" is indicated on the display section 53 of the operating panel 50 (S42). Further, the accumulation timer is checked to see whether the time of level 2 has been exceeded (S43). If the time of level 2 is not exceeded, the process ends, while if it is exceeded, the copying operation is prohibited (S44).

Now, the operation of the copier 1 using routines A to D will be explained with reference to the flowchart of FIG. 16.

The copier 1 is checked whether it is in copying operation or not as routine E (S51), and if it is in copying operation, the process ends. In the case where the copier 1 is not copying but waiting, the accumulation timer is updated by routine A, routine B or routine C (S52). The time on the accumulation timer is checked by routine D, and maintenance work corresponding to the result of check is executed (S53).

As explained above, according to this embodiment of the invention, a new preventive maintenance means can be provided for accurately grasping in advance the life of the parts such as the fixing roller or the fixing silicon roller which deteriorates in characteristics in accordance with the length of waiting time. Even a copier very infrequently used, therefore, can be kept in a superior operating condition.

CPU) 1311 for controlling these means.

The main CPU 1100 of the control means (basic CPU) 1311 is connected to a ROM 1102, a RAM 1104, an image memory 1106, a timer memory 1108, a password code memory 1110, a timer 1112, an internal interface 1122, and an external interface 1124. The internal interface 1122 is connected with an operating panel 1114, which in turns has arranged thereon an LCD display 1116, a ten-key board 1118, a job password mode button 1120, a copy key 1121, etc.

Now, a detailed configuration of the scanner 1313 will be explained with reference to FIG. 20. The scanner CPU 1160 of the scanner 1313 is connected to and controls a lamp controller 1164 for controlling an illumination lamp 1006, a motor driver 1168 for controlling a scanning motor 1166, a drive unit 1172 for driving sensors including an original size sensor 1169, switches and solenoids 1170. The scanner CPU 1160 is also connected to and controls an A/D converter 1176 for processing image information from a photoelectric transducer 1111, a resolution changer 1178, a shading corrector 1176, an image quality improver 1180 and binarizing circuit 1182.

Now, the page memory 1302, the IC card and the nonvolatile RAM for storing the maintenance program constituting the feature of the present invention will be explained with reference to FIG. 19. The page memory 1302 includes a memory means (page memory) for storing image data temporarily, an address controller 1306 for generating an address of the page memory 1323, an image bus 1320 for transferring data between the devices in the page memory 1302, a data control means 1307 for controlling the data transfer which may be made between the page memory 1323 and the other devices through the image bus 1320, an image data I/F means 1308 providing an interface for transferring the image data to and from the basic unit 1301 through the basic unit image interface 1317, a resolution changer/binary rotation means 1325 for changing the image data resolution to that of another device to which the image data is transmitted, changing the image data received from a device of a different resolution into the resolution of the printer 1315 of the basic unit 1301 or rotating the binary image data by 90 degrees, a compression/expansion means 1321 for compressing the image data input for transmission or storage devices using the image data in compressed form such as a facsimile or an optical disk or decompressing into a visible form the compressed image data through the printer 315, and a multi-valued rotation memory 1309 used when the image data output is rotated by +90 or -90 degrees. The image data I/F means 1308, which is connected to a network, is for transmitting information input thereto through the scanner of the D-PPC to other devices or receiving the information transmitted from other devices and transmitting them to the printer.

The basic unit includes a nonvolatile RAM 64 connected to the basic unit bus system, an IC card interface 2 having an IC card insertion hole and an IC card 6. These devices are for storing the maintenance program of the present invention, and are connected through the data bus, the image data I/F 1308 and the communication line to an external server 1331 or other D-PPC 1330, from which the maintenance program, etc. can be received.

The maintenance program is supplied from an external source such as the D-PPC described above according to the invention in the manner mentioned below.

First, the D-PPC, which has the function of communicating the image information in binary (or other multi-digit) form, is applicable in a network system as shown in FIG. 19. In such a case, the text data prepared at a PC terminal are sent to the D-PPC and printed out. Conversely, an image of the original read by the D-PPC may be stored in a file server or in the HDD of the PC. The whole system having such functions is managed by the server 1331 through the communication line 1326.

Now, the procedure for processing the maintenance program sent from the server constituting the feature of the invention will be explained with reference to the flowcharts of FIGS. 17A, 17B and 17C. The flowcharts of FIGS. 17A, 17B and 17C represent the first, second and third embodiments, respectively, each having the function of fetching a new processing program according to the invention.

In the first embodiment shown in FIG. 17A, in the case where some error occurs on the D-PPC (S61) or in the case where a program is not requested (S63), the program stored in the memory of the D-PPC is executed by the CPU in the D-PPC thereby to obviate the error (S71).

In the case where an error is processed according to the program sent from the server 1331, a request for the maintenance program is sent through the network together with the contents and history of the particular error (S63). In the process, however, the D-PPC makes no decision on the the type of program to be requested.

The server 1331 totalizes and analyzes the error information sent from the D-PPC, and predicts an error likely to occur in the D-PPC or analyzes the error tendency (features) of the D-PPC. As a result of analyzing the error information from the D-PPC, the server selects an anti-error program corresponding to the error tendency of the D-PPC and transmits this program to the D-PPC.

The D-PPC receives and stores this anti-error program in the memory (S67). The CPU of the D-PPC processes the error according to this program (S69).

Further, according to the second embodiment shown in FIG. 17B, in the case where an error or other fault occurs on the D-PPC (S81), for example, the error is corrected by the CPU in the D-PPC according to the first stored program (S83). At the same time, the content and history of the particular error is transmitted to a server through the network. In the case where the error cannot be obviated by the first program, a request signal is issued requesting a second program (S85).

3. An image forming apparatus according to claim 1 or 2, characterized in that the first control means includes;

means (S81, S83, S85, S87) for operating the image forming means based on the first program when the detected status of the image forming apparatus is an error of the image forming apparatus; and
means (S85, S87) for requesting the second program in case when the error cannot be obviated by the first program, requesting the second program.

4. An image forming apparatus according to claim 1 or 2, characterized in that the second memory means (64, 6, S67, S89) includes;

means (2), arranged on the image forming apparatus, for enlarging a storage area of the second memory means to store the second program with a detachable storage medium (6) mounted thereon.

5. An image forming apparatus according to claim 1 or 2 characterized in that each of the requesting means (60, 64, S65, S87) and the receiving means (3, 67, 1308, S67, S89) includes;

means (67, 1308), connected to the image forming apparatus, for exchanging each signal with a server computer (70, 1331) constituting the external device through a communication line (1326).

6. An image forming apparatus according to claim 1 or 2, characterized by further comprising;

second requesting means (S93) for requesting another program different from the second program in case when the detected status of the image forming apparatus is an error of the image forming apparatus and cannot be obviated through a process performed by the first control means based on the first and second programs;
second control means (S94) for controlling the image forming apparatus based on the third program supplied in accordance with the request from the second requesting means; and
means (S93, S94) for repetitively performing the operations of the second requesting means and the second control means of different programs from the first, second and third programs until the error is obviated.

7. An image forming apparatus according to claim 6, characterized in that the first and second requesting means include;

means (S109, S111) for selecting a proper program based on the status detected by the detecting means and supplying a request signal to the external device to request the selected program.

8. An image forming apparatus according to claim 1 or 2, characterized in that the first and second requesting means include;

means (S109, S111) for selecting a proper program based on the status detected by the detecting means and supplying a request signal to the external device to request the selected program.

9. An image forming apparatus according to claim 1 or 2, characterized by further comprising:

means (1301) for receiving at regular time intervals from the external device a first signal requesting information relating to the apparatus status detected by the detecting means, and supplying the information and a second signal requesting a required program to the external device corresponding to the first signal.

10. An image forming system comprising:

an image forming apparatus having,
means (12, 13, 14, 15, 1301, 1302) for reading an image of an original and forming the image,
means (22, 41, 43, 47, 48, 49) for detecting a status of the image forming apparatus on an image-forming medium;
first memory means (64) for storing a first program for controlling the image forming means,
means (60, 64, S65, S87) for requesting a second program for controlling the image forming apparatus in accordance with the apparatus status detected by the detecting means,
means (3, 67, 1308, S67, S89) for receiving the second program from a server (1331) in response to the request from the requesting means,
second memory means (64, 6, S67, S89) for storing the second program received by the receiving means, and
means (5, 60, 1311, S69, S71, S83, 91) for controlling the image forming means based on the first program and the second program;
a server apparatus (1331) having,
means (1331) for supplying image information and a control signal to the image forming apparatus and controlling on operation of the image forming apparatus, and

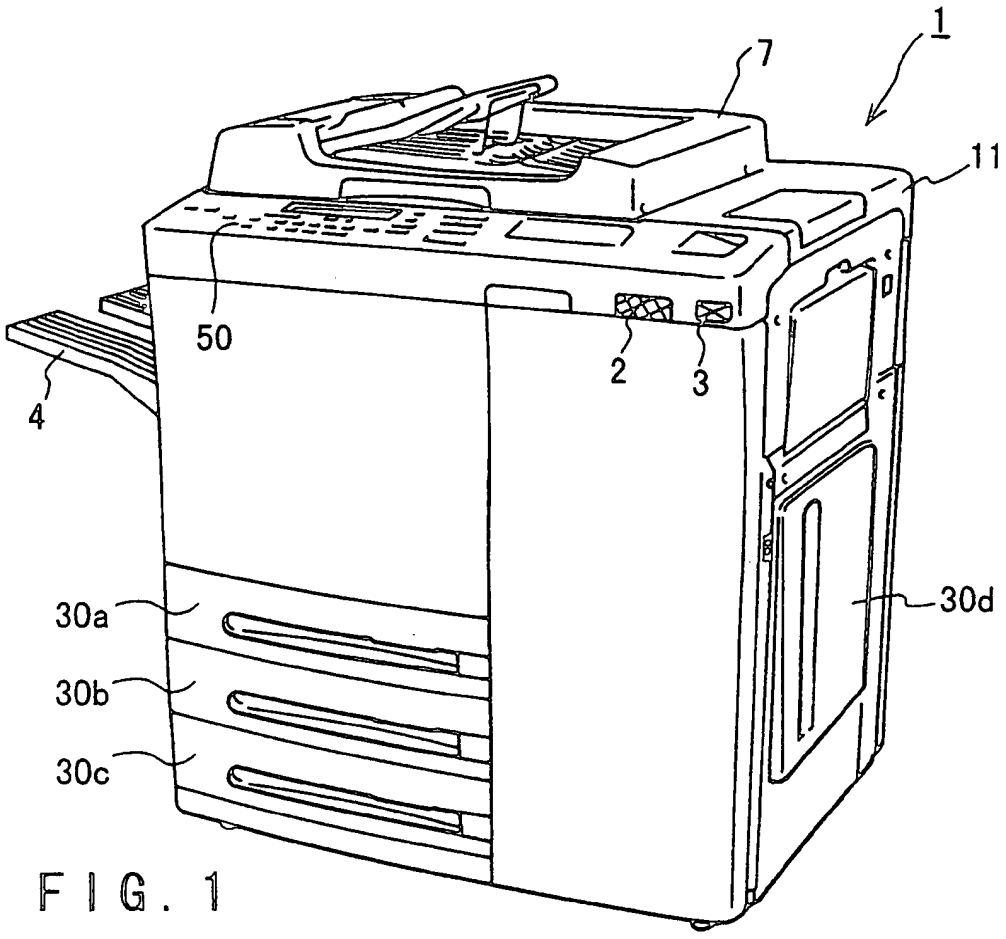

FIG. 1

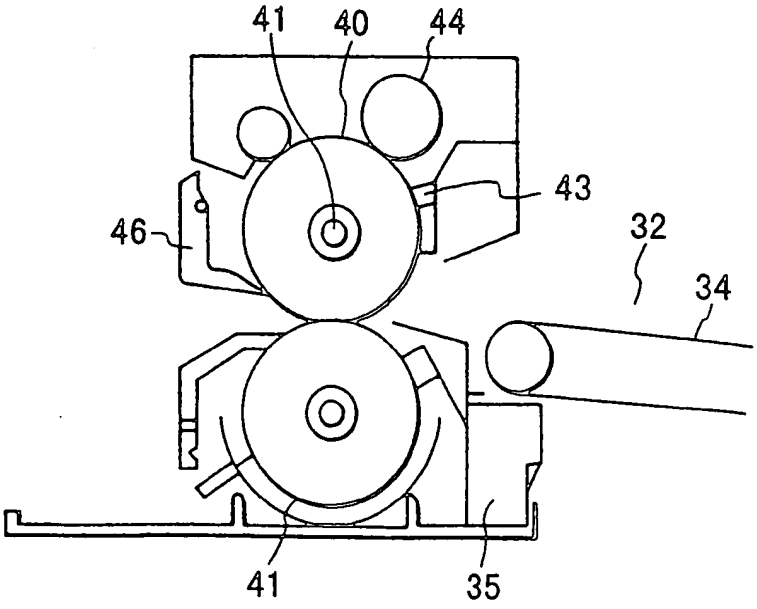

FIG. 3

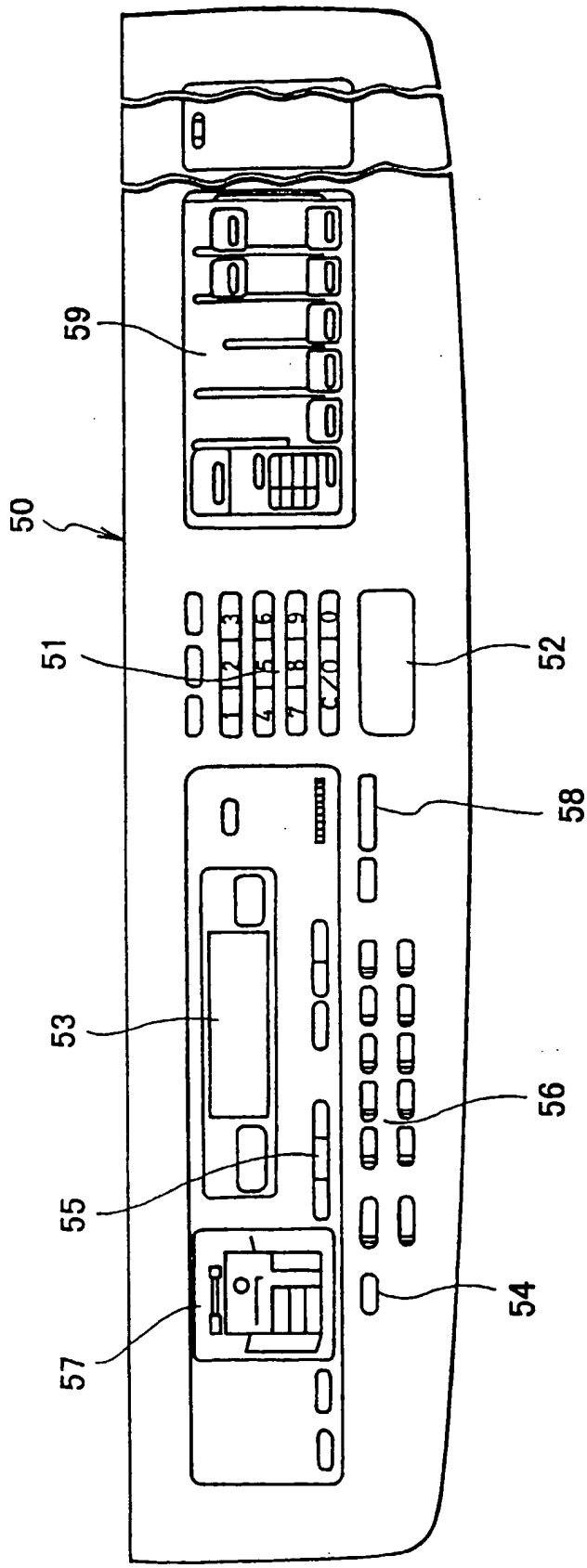

FIG. 4

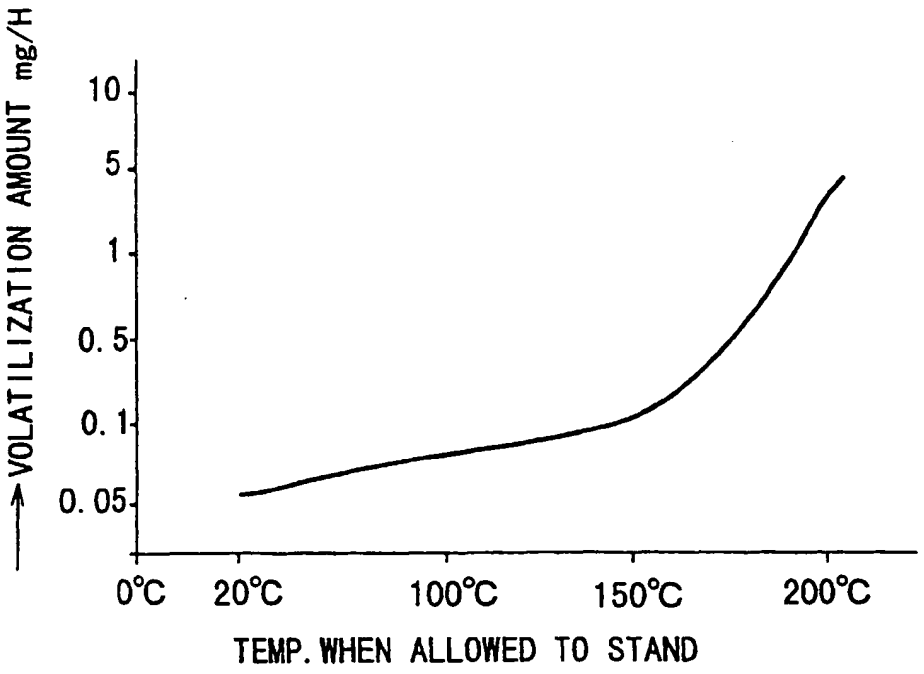
VOLATILIZATION AMOUNT mg/H
10
5
1
0.5
0.1
0.05
0°C
20°C
100°C
150°C
200°C
TEMP. WHEN ALLOWED TO STAND

FIG. 7

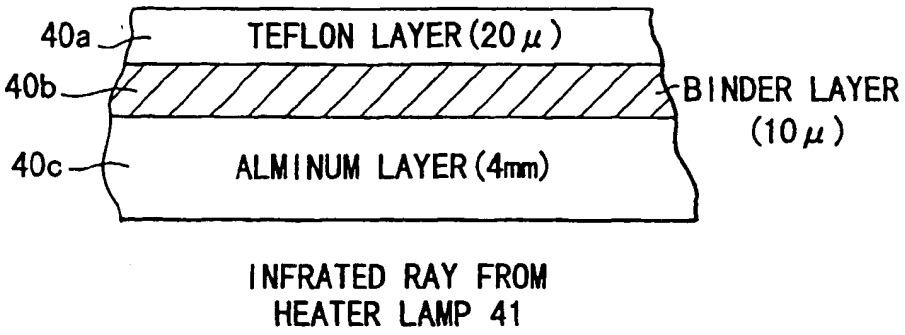
40a
TEFLON LAYER (20 μ)
40b
BINDER LAYER
(10 μ)
40c
ALMINUM LAYER (4mm)
INFRATED RAY FROM
HEATER LAMP 41

FIG. 8

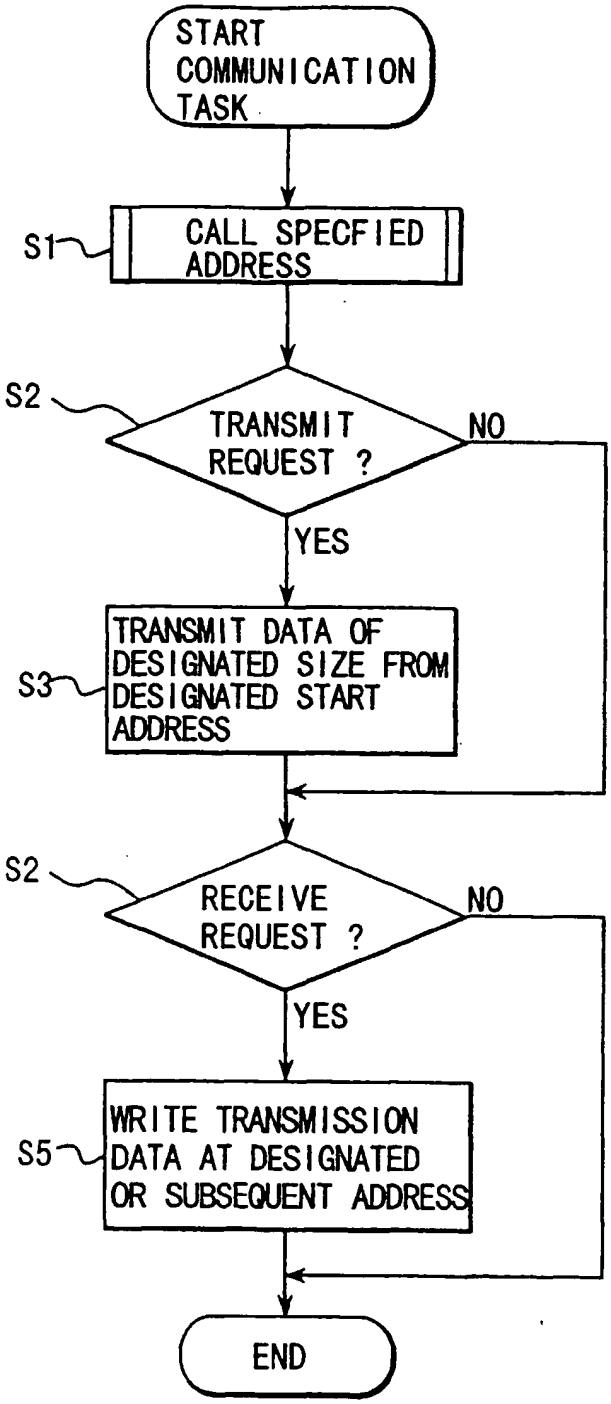
START COMMUNICATION TASK
S1
CALL SPECFIED ADDRESS
S2
TRANSMIT REQUEST ?
NO
YES
S3
TRANSMIT DATA OF DESIGNATED SIZE FROM DESIGNATED START ADDRESS
S2
RECEIVE REQUEST ?
NO
YES
S5
WRITE TRANSMISSION DATA AT DESIGNATED OR SUBSEQUENT ADDRESS
END

FIG. 10

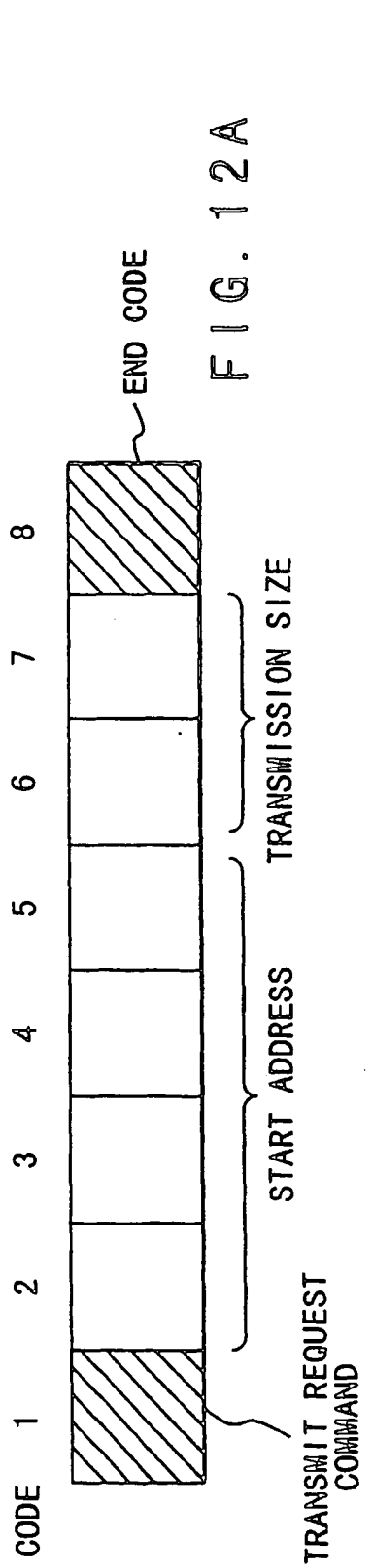

FIG. 12A

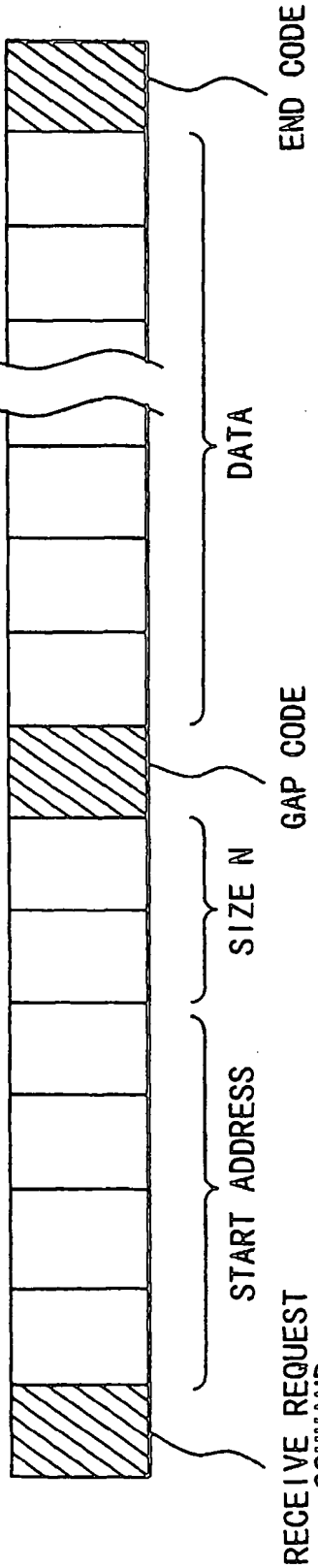

FIG. 12B

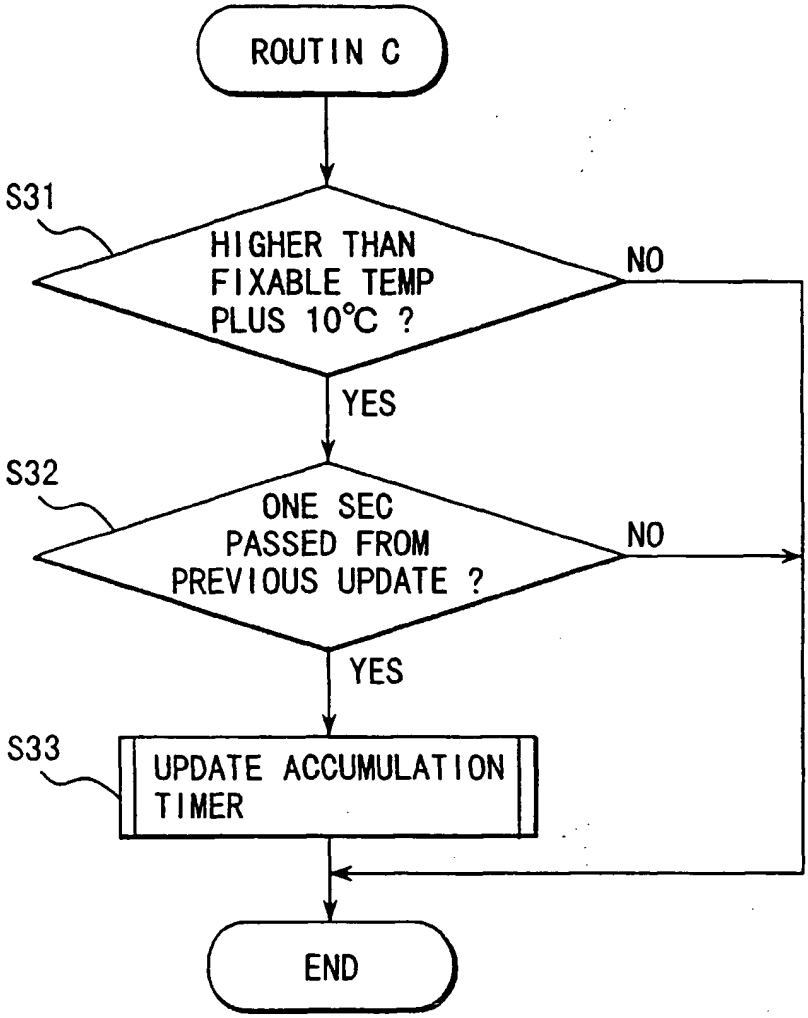

FIG. 14

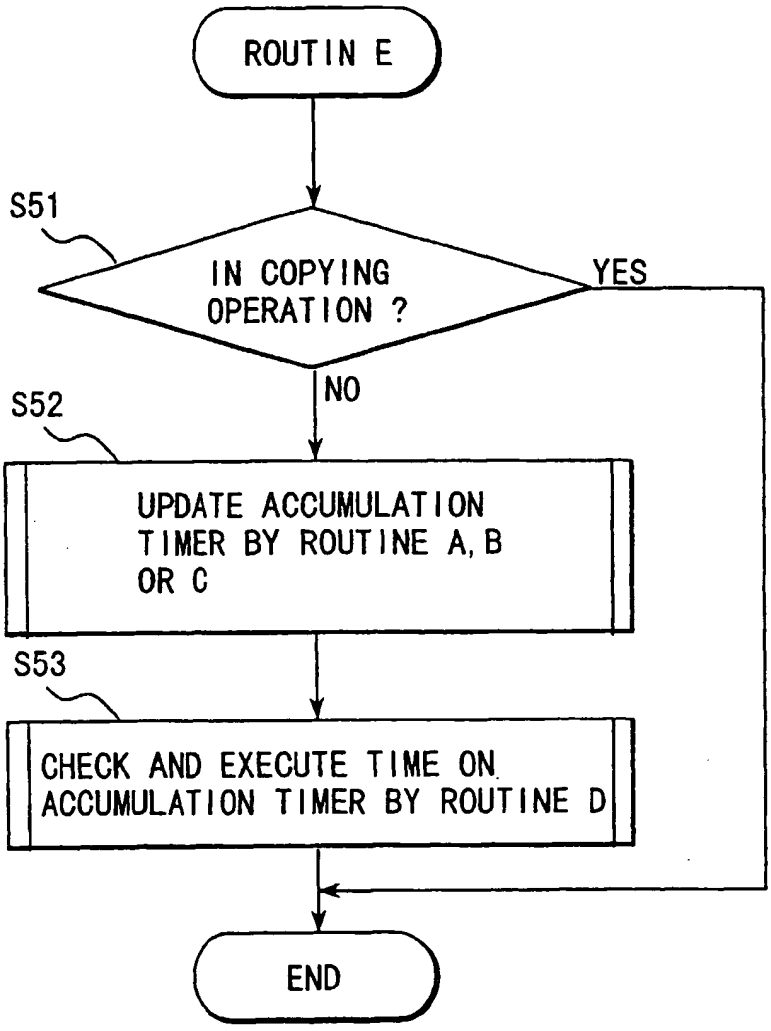

FIG. 16

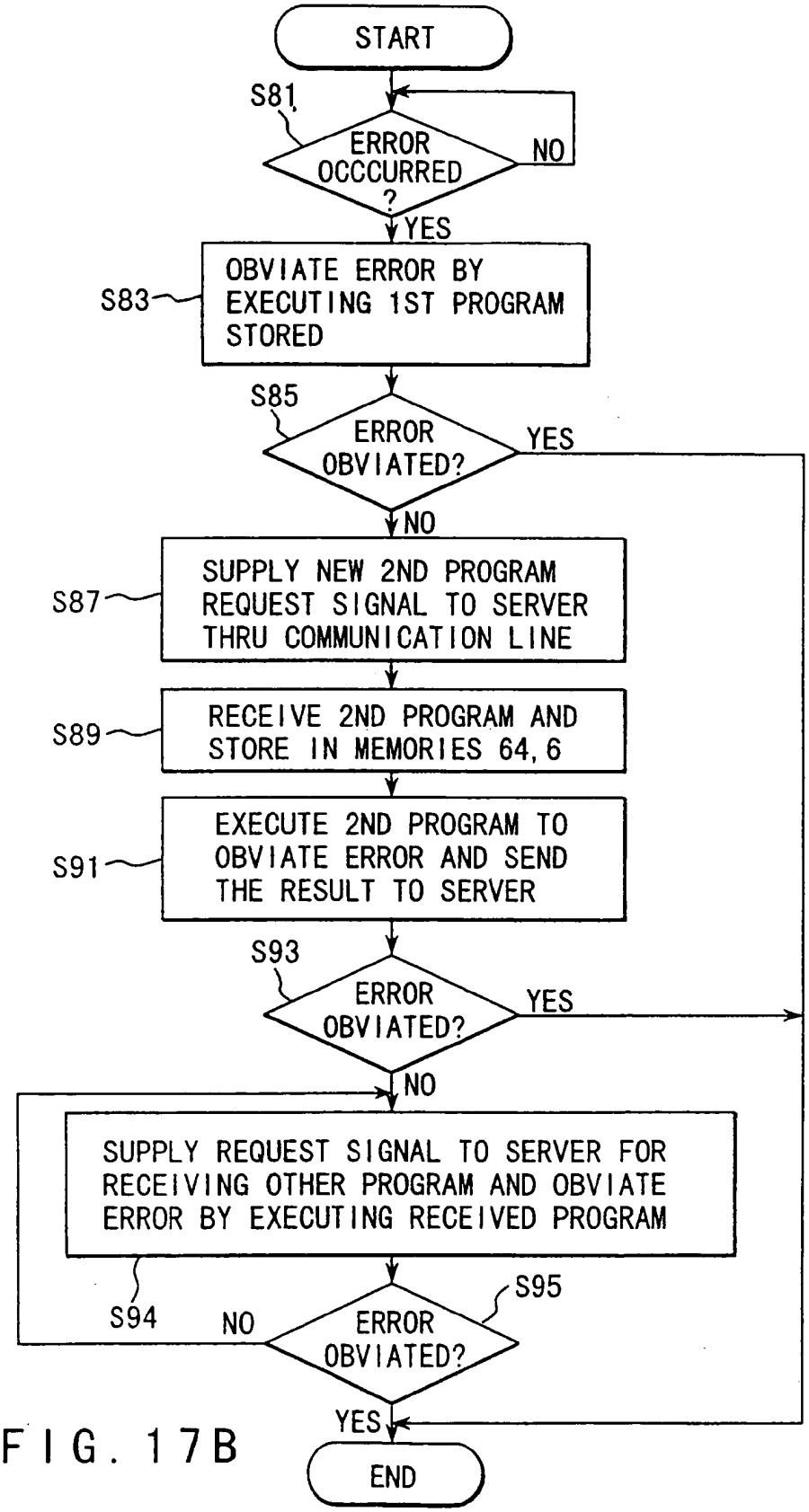
START
S81
ERROR OCCCURRED ?
NO
YES
S83
OBVIATE ERROR BY EXECUTING 1ST PROGRAM STORED
S85
ERROR OBVIATED?
YES
NO
S87
SUPPLY NEW 2ND PROGRAM REQUEST SIGNAL TO SERVER THRU COMMUNICATION LINE
S89
RECEIVE 2ND PROGRAM AND STORE IN MEMORIES 64, 6
S91
EXECUTE 2ND PROGRAM TO OBVIATE ERROR AND SEND THE RESULT TO SERVER
S93
ERROR OBVIATED?
YES
NO
SUPPLY REQUEST SIGNAL TO SERVER FOR RECEIVING OTHER PROGRAM AND OBVIATE ERROR BY EXECUTING RECEIVED PROGRAM
S94
NO
S95
ERROR OBVIATED?
YES
END

FIG. 17B

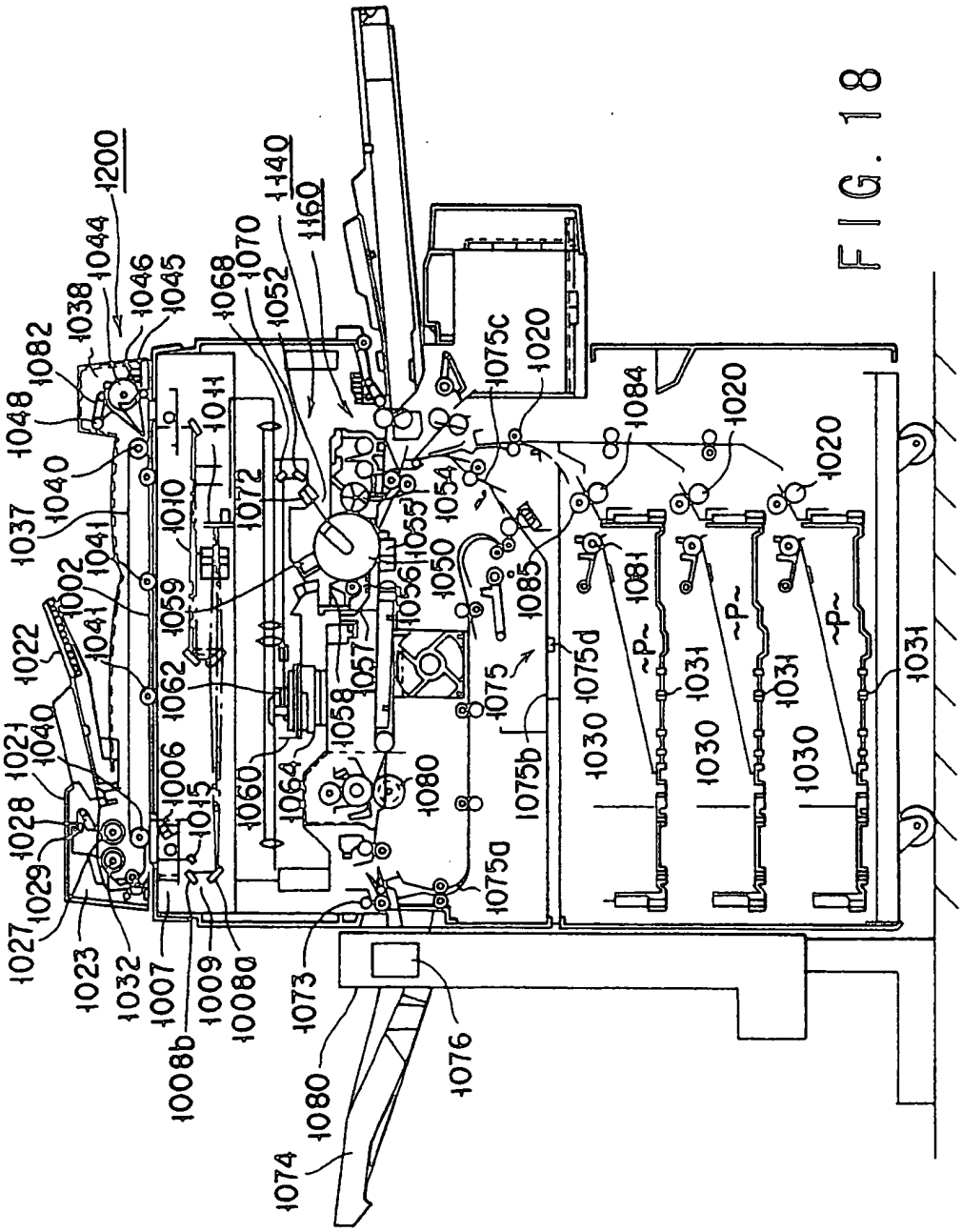
1200
1140
1160
1044
1038
1046
1045
1068
1070
1052
1082
1048
1040
1037
1041
1002
1022
1021
1028
1029
1027
1023
1032
1007
1008b
1009
1008a
1073
1074
1080
1076
1075a
1075b
1075c
1075d
1020
1084
1085
1081
1031
1030
1034
1054
1055
1056
1050
1057
1058
1059
1062
1060
1064
1006
1015
1010
1011
1072
~P~

FIG. 18

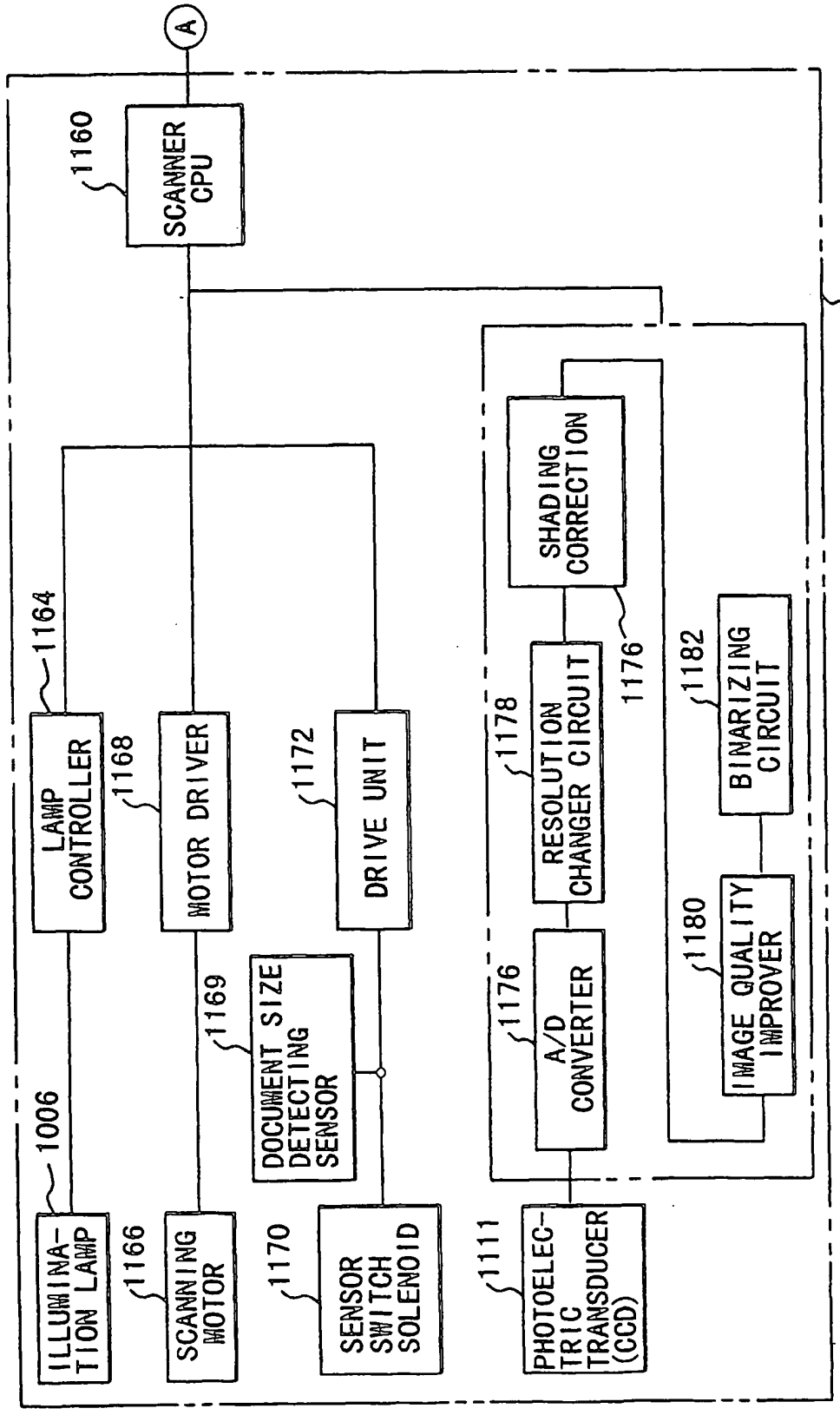
A
1160
SCANNER CPU
1313
1164
LAMP CONTROLLER
1168
MOTOR DRIVER
1172
DRIVE UNIT
SHADING CORRECTION
1178
RESOLUTION CHANGER CIRCUIT
1176
1182
BINARIZING CIRCUIT
1006
ILLUMINATION LAMP
1166
SCANNING MOTOR
1169
DOCUMENT SIZE DETECTING SENSOR
1170
SENSOR SWITCH SOLENOID
1111
PHOTOELECTRIC TRANSDUCER (CCD)
1176
A/D CONVERTER
1180
IMAGE QUALITY IMPROVER

FIG. 20

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(54) Image forming apparatus having remote maintenance function and method of remote maintenance

(57) An image forming apparatus is disclosed, in which the operating program can be changed even after the apparatus is delivered to the customer to perform the control meeting the prevailing status of the apparatus. An image of an original is read and formed by a mechanism (12 to 15), the status of the image forming apparatus is detected by a sensor (22, 41), a first program for controlling the image forming mechanism is stored in a memory (64), a second program for controlling the apparatus according to the detected status is requested by a mechanism (3, 67, S67), the second program is received by and stored in a memory (64, S67) according to the request, and the image forming apparatus is controlled by a mechanism (5, S69)in accordance with the first and second programs.

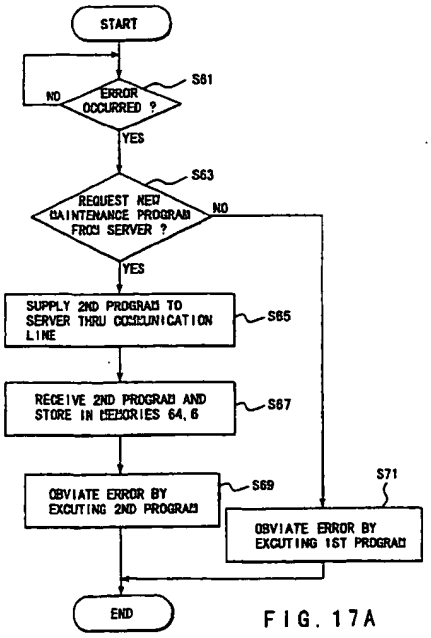

FIG. 17A

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